

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

CLASS PERIODS: 1

LAB PERIODS: 0

Enabling Objectives:

- 17.1 **IDENTIFY** the types of Damage Control Equipment in accordance with Damage Control 3 & 2, NAVEDTRA 10572

2. TM, Personnel Protection Equipment, NSTM-Chapter 077, NSTM-S9086-CL-STM-010/CH-077
3. TM, Surface Ship Firefighting, NSTM-Chapter 555, Volume 1, NSTM-S9086-S3-STM-010/CH-555 V1

C. Training Materials Required:

Trainee Preparation Materials:

A. Trainee Support Materials:

1. None

B. Reference Publications:

1. None

Instructor Preparation:

A. Review Assigned Trainee Material

B. Reference Publications:

1. Damage Control 3 & 2, NAVEDTRA 10572

1. Transparencies
 - a. AFFF System used with Firehose, 20-1-14
 - b. Aluminized Proximity Suit, 20-1-22
 - c. Anti-Flash Hood, 20-1-21
 - d. BioMarine Oxygen Analyzer, 20-1-24
 - e. Carbon Dioxide Hose Reel System, 20-1-6
 - f. CO2 Flooding System, 20-1-7
 - g. Combustible Gas Indicator, 20-1-25
 - h. Damage Control Equipment, 20-1-1
 - i. Drager Multi-Gas Indicator, 20-1-26
 - j. Dry Chemical Fire Extinguisher, 20-1-4
 - k. Dry Chemical Fire Extinguisher, 20-1-15
 - l. Emergency Escape Breathing Device (EEBD), 20-1-28
 - m. Firefighter's Ensemble, 20-1-20
 - n. Foam, 20-1-3
 - o. Halon 1301 System, 20-1-8
 - p. Horizontal Loop Firemain System, 20-1-9
 - q. Naval Firefighter's Thermal Imager (NFTI), 20-1-27

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

- r. Oxygen Breathing Apparatus (OBA), 20-1-18
- s. P-100 Portable Pump, 20-1-17
- t. P-250 Portable Pump, 20-1-16
- u. Portable CO2 Bottle Extinguisher, 20-1-5
- v. Self-Contained Breathing Apparatus (SCBA),
20-1-19
- w. Standard Applicators, 20-1-13
- x. Summary, 20-1-29
- y. Tending Line, 20-1-23
- z. Typical Fire Station, 20-1-10
- aa. Typical Fireplug, 20-1-11
- ab. Vari-Nozzles, 20-1-12
- ac. Water, 20-1-2

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

1. Introduction

RELATED INSTRUCTOR ACTIVITY

1. Establish Contact.

Write name on VAP board.

Introduce Yourself.

Damage control is an ALL HANDS responsibility. The Navy has developed special equipment, techniques, and training to ensure all personnel are capable of properly executing damage control procedures.

In this topic, we will discuss types of damage control equipment to include fire extinguishing agents, firefighting equipment and systems, and flooding control systems. We will also discuss firefighter protective equipment.

State Lesson Objectives.

2. Damage Control Equipment

2. Reference TM, Surface Ship Firefighting, NSTM-Chapter 555, Volume 1, NSTM-S9086-S3-STM-010/CH-555 V1.

a. Fire Extinguishing Agents

a. Show Transparency 20-1-1, Damage Control Equipment.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (1) The agents used in any particular event will depend upon the classification of the fire and the general circumstances surrounding the fire
- (2) Water
 - (a) Used against A, B, and D fires
 - (b) Most effective cooling agent
 - (c) Available in large quantities
 - (d) Has the greatest capacity for heat absorption
 - (e) Supplied by all-purpose nozzle
 - (f) Used against class "C" fire as a last resort.
Potential electrical shock hazard

RELATED INSTRUCTOR ACTIVITY

- (2) Show Transparency 20-1-2, Water.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (3) Aqueous Film Forming Foam (AFFF)
 - (a) Used against class "B" fires
 - (b) Highly effective for smothering large fires, such as oil, gasoline, and jet fuels
- (4) Dry Chemicals
 - (a) Used against class "B" fires. However, it can be used against all classes of fires
 - (b) Extinguishes fires by using a chemical mechanism
- (5) Carbon Dioxide (CO₂)

RELATED INSTRUCTOR ACTIVITY

- (3) Show Transparency 20-1-3, Foam.
- (4) Show Transparency 20-1-4, Dry Chemical Fire Extinguisher.
- (5) Show Transparency 20-1-5, Portable CO₂ Bottle Extinguisher.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (a) Used against all classes of fires
- (b) Extinguishes fires by reducing the amount of oxygen available for combustion
- (c) CO2 fire extinguishing equipment includes:
 - 1) Portable 15-pound extinguisher
 - 2) 50-pound hose-and-reel system - provides a dependable and readily available means to flood certain areas that present unusual fire hazards
 - 3) 50-pound installed flooding system - used for spaces that are not normally occupied by personnel such as magazines and shaft alleys

RELATED INSTRUCTOR ACTIVITY

- 2) Show Transparency 20-1-6, Carbon Dioxide Hose Reel System.
- 3) Show Transparency 20-1-7, CO2 Flooding System.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

(6) Halon 1301

(a) Used against class A, B, and C fires

(b) A relatively new fire extinguishing agent used in the Navy

(c) A colorless, odorless gas with a density almost five times that of air

b. Firefighting Equipment and Systems

(1) Firemain Systems

(a) Receives water pumped from the sea

RELATED INSTRUCTOR ACTIVITY

(6) Show Transparency 20-1-8, Halon 1301 System.

(1) Show Transparency 20-1-9, Horizontal Loop Firemain System.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | |
|--|--|
| (b) Used primarily to supply fire stations and the sprinkler systems | |
| (c) Also used for: | |
| 1) Flushing systems | |
| 2) Machinery cooling-water systems | |
| 3) Washdown systems | |
| (2) Fire Stations - consists of a fireplug, firehose, nozzles, and applicators | (2) Show Transparency 20-1-10, Typical Fire Station. |
| (a) Fireplug - connects firemain system to the firehose | (a) Show Transparency 20-1-11, Typical Fireplug. |

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (b) Firehose - a double-jacketed, rubber-lined cotton hose that is 50 feet in length
- (c) Vari-Nozzles
 - 1) Vari-Nozzles are used to direct water or AFFF at the fire
 - 2) The nozzle spray pattern can be varied from straight stream through a range up to at least 90-degree fog stream by rotating the black shroud tip or the nozzle
 - 3) The flow rate can also be throttled from a trickle to full flow by operating the bail handle shut off handle
- (d) Applicators - used on flight decks to spread a mist (called fog) over a large area

RELATED INSTRUCTOR ACTIVITY

- (c) Show Transparency 20-1-12, Vari-Nozzles.
- 2) Point out black shroud tip.
- 3) Point out bail handle shut off handle.
- (d) Show Transparency 20-1-13, Standard Applicators.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

NOTE: The Navy All-Purpose (NAP) nozzle is used with these applicators.

(3) Aqueous Film Forming Foam (AFFF) System

(3) Show Transparency 20-1-14, AFFF System used with Firehose.

(a) Used in conjunction with water or dry chemical to fight class "B" fires

(b) Composed of synthetically-produced materials similar to liquid detergents

(c) Provides three fire extinguishing advantages. They are:

- 1) An aqueous film is formed on the surface of the fuel to prevent the escape of fuel vapors

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- 2) The foam effectively excludes oxygen from the fuel surface
- 3) The water content of the foam provides a cooling effect
- (4) Magazine Sprinkler Systems - used for emergency cooling of, and fire fighting unmanned spaces such as:
 - (a) Magazines
 - (b) Ready-service rooms
 - (c) Ammunition and missile-handling rooms
- (5) Fog and Water Curtains - produces mist curtains to prevent the rapid spread of fires onboard aircraft carriers
- (5) Reference Damage Control 3 & 2, NAVEDTRA 10572.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (6) Dry Chemical Extinguishers
 - (a) Primarily used on class "B" fires
 - (b) Uses Potassium Bicarbonate (PKP) as the extinguishing agent
 - (c) Used to extinguish the fire by breaking the combustion chain
 - (d) If used on class "C" fires, it will leave a residue that may be hard to clean
- (7) P-250 Portable Pump - a gasoline-driven portable water pump with an internal combustible engine which is used in firefighting and dewatering operations

RELATED INSTRUCTOR ACTIVITY

- (6) Show Transparency 20-1-15, Dry Chemical Fire Extinguisher.
- (7) Show Transparency 20-1-16, P-250 Portable Pump.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

(8) P-100 Portable Pump

(a) A commercial diesel engine driven pump designed for firefighting and limited dewatering functions

(b) Has a rated capacity of 100 gallons per minute (GPM) at 83 psi

(c) Can also be used to provide AFFF when using the AFFF inline educator

c. Firefighting Protective Equipment

(1) Oxygen Breathing Apparatus (OBA)

RELATED INSTRUCTOR ACTIVITY

(8) Show Transparency 20-1-17, P-100 Portable Pump.

c. Reference TM, Personnel Protection Equipment, NSTM-Chapter 077, NSTM-S9086-CL-STM-010/CH-077.

(1) Show Transparency 20-1-18, Oxygen Breathing Apparatus (OBA).

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (a) A self-contained, closed-circuit device which generates oxygen
- (b) Enables the wearer to breathe independently of the outside atmosphere
- (c) Major components are:
 - 1) A quick start canister containing chemicals which generate oxygen for breathing and removing CO₂ and water vapor from the exhaled air
 - 2) A rubber face-piece with adjustable harness and breathing tubes
 - 3) Breathing bags for storing reserve air that has been made ready for breathing

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- 4) A timing device to warn the wearer when the canister chemicals are used up
 - (d) Wearer can enter spaces that contains:
 - 1) Smoke
 - 2) Dust
 - 3) Fire
 - 4) Low oxygen content
 - (2) Self-Contained Breathing Apparatus (SCBA)
 - (a) Supplies breathable air from pressurized air bottles carried by the user
- (2) Show Transparency 20-1-19, Self-Contained Breathing Apparatus (SCBA).

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (b) Major parts consist of:
 - 1) Air bottle support harness
 - 2) One (sometimes more than one) air bottle
 - 3) Regulator
 - 4) Timer/alarm
 - 5) Breathing tube
 - 6) Face-piece
- (c) Used in any atmosphere that requires respiratory protection

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (3) Firefighter's Ensemble

RELATED INSTRUCTOR ACTIVITY

- (3) Show Transparency 20-1-20, Firefighter's Ensemble.

- (a) Intended to protect the firefighter from:

- 1) Short duration flame (flash) exposure

- 2) Heat

- 3) Falling debris

- (b) Damage Control/Firefighter's Helmet

- 1) Designed to protect the head, neck, and face from short duration flame (flash) exposure, heat, and falling objects

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- 2) Provided with a face shield to help protect the eyes
 - (c) The Coverall:
 - 1) Designed in a one-piece, jump-suit style
 - 2) Contains a tough outer shell, a vapor barrier, and an inner fire-retardant thermal liner
 - (d) The Anti-Flash Hood:
 - 1) Provides protection to the head, neck, and face
 - 2) Can be worn with the OBA
- (d) Show Transparency 20-1-21, Anti-Flash Hood.
 - 1) NOTE: The hood does not protect the eyes.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

(4) Proximity Suit

- (a) Provides aircraft firefighting teams with thermal protection while rescuing aircraft personnel when crashes occur
- (b) Provides the wearer with thermal protection while operating close to large fires
- (c) Consists of:
 - 1) Aluminized shoulder length hood
 - 2) Aluminized coat
 - 3) Aluminized trousers with suspenders

RELATED INSTRUCTOR ACTIVITY

- (4) Show Transparency 20-1-22, Aluminized Proximity Suit.

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | |
|--|--|
| 4) Aluminized gloves | |
| 5) Fireman's boots | |
| (5) Tending Lines - used as a precautionary measure to help rescue firefighters who are wearing OBAs, protective masks, or similar equipment | (5) Show Transparency 20-1-23, Tending Line. |
| (6) Atmosphere Testing Equipment | |
| (a) Oxygen analyzer used to verify the percentage of oxygen within a space | (a) Show Transparency 20-1-24, BioMarine Oxygen Analyzer. |
| (b) Combustible Gas Indicators - used to detect various flammable gases and vapors | (b) Show Transparency 20-1-25, Combustible Gas Indicator. |
| (c) Drager Multi-Gas Detector - used to test the atmosphere within a space for toxic gases such as: | (c) Show Transparency 20-1-26, Drager Multi-Gas Indicator. |

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- | | |
|--|---|
| 1) Carbon Dioxide | |
| 2) Carbon Monoxide | |
| 3) Nitrogen Dioxide | |
| 4) Hydrogen Sulfide | |
| (7) Naval Firefighter's Thermal Imager (NFTI) - a device that allows the user to see through dense smoke and light steam | (7) Show Transparency 20-1-27, Naval Firefighter's Thermal Imager (NFTI). |
| (8) Emergency Escape Breathing Device (EEBD) | (8) Show Transparency 20-1-28, Emergency Escape Breathing Device (EEBD). |
| (a) Provides a 15-minute supply of breathable air | |

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

- (b) Used to provide respiratory and eye protection in an atmosphere that will not support life

RELATED INSTRUCTOR ACTIVITY

3. Summary

3. Show Transparency 20-1-29, Summary.

a. Fire Extinguishing Agents

b. Firefighting Equipment and Systems

c. Firefighting Protective Equipment

4. Assignment

a. None

5. Evaluation

LESSON PLAN

Unit 20. DAMAGE CONTROL

X-XXX-XXX2 Rev B

Topic 20.1 Damage Control Equipment

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

6. None